APPROVED BY
BUREAU OF EXPLOSIVES
E. P. Ballen SUPERVISOR, MILITARY & INTERMODAL SERVICES
SUPERVISOR, MILITARY & INTERMODAL SERVICES
DATE 9/28/82

# LOADING AND BRACING (TL & LTL) IN CLOSED OR OPEN TOP VAN TRAILERS OF ONE-TON CONTAINERS (FILLED)

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INDEX

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### GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE LOADS AS SHOWN ARE BASED ON VAN TYPE TRAILERS 40'-0" LONG BY 92" WIDE (INSIDE WIDTH) HAVING WOOD OR WOOD AND METAL FLOORS. TRAILERS HAVING ALL METAL FLOORS WILL NOT BE USED. THE PROCEDURES ARE ALSO APPLICABLE FOR TRAILERS WHICH ARE EIGHTY-NINE INCHES (89") THRU NINETY-THREE INCHES (93") IN WIDTH AND FOR TRAILERS OF OTHER LENGTHS, UP TO AND INCLUDING 45'-0" LONG.
- C. FOR DETAIL OF THE ONE-TON CONTAINER, SEE TM 3-250 AND PAGE 3 OF THIS DRAWING.

ITEM DIMENSIONS-------- 6'-9-1/2" LONG X 30-1/2" DIAMETER. GROSS WEIGHT------ 3,200 LBS (APPROX)

- D. SELECTION OF A VEHICLE USED TO TRANSPORT THE DESIGNATED ITEMS MUST COMPLY WITH AR 55-355, CHAPTER 213, FOR EXPLOSIVES AND OTHER DANGEROUS ARTICLES, IN FULL
- E. GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF THE APPLICABLE LOADING REQUIREMENTS, AND THE SHIPPER WILL LOAD ACCORDINGLY.
- F. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE TRAILER CONSISTENT WITH
  THE STATE WEIGHT LAWS. THE NUMBER OF UNITS MAY BE ADJUSTED TO FIT
  THE QUANTITY TO BE SHIPPED, HOWEVER, THE APPROVED METHODS CONTAINED
  HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING
  AND STAYING OF THE DESIGNATED ITEMS.
- G. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED ONE-TON CONTAINERS WHEN THEY ARE EMPTY.
- H. WHEN ANY STRAP IS SEALED AT AN END-OVER-END LAP JOINT, ONE SEAL WITH TWO PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT.
- J. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- K. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN
  NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO A STAGGERED
  NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE
  TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN
  WILL BE ADJUSTEU AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR
  NEAR A CRACK BETWEEN FLOOR BOARDS. ADJITIONALLY, THE NAILING PATTERN
  FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO
  THAT A NAIL FOR THAT PIECE WILL NOT BE URIVEN THROUGH ONTO OR RIGHT
  BESIDE A NAIL IN A LOWER PIECE.
- L. CAUTION: DO NOT NAIL THE BLOCKING SHOWN HEREIN TO THE TRAILER WALLS. ALL NAILING WILL BE WITHIN THE DUNNAGE OR TO THE TRAILER FLOOR.
- M. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN A TRAILER WHICH IS PARTIALLY LOADED WITH THE DESIGNATED ITEMS, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED.

(CONTINUED AT RIGHT)

#### MATERIAL SPECIFICATIONS

			DUNNAGE LUMBER;	
 <u>NG</u> '	: CLASS OR C;	I, TYPE I C	PEC FF-N-105.  OR IV, HEAVY DUTY,  OQ-5-781.  II OR IV, CLASS H; F	FINISH A, B (GRADE 2)
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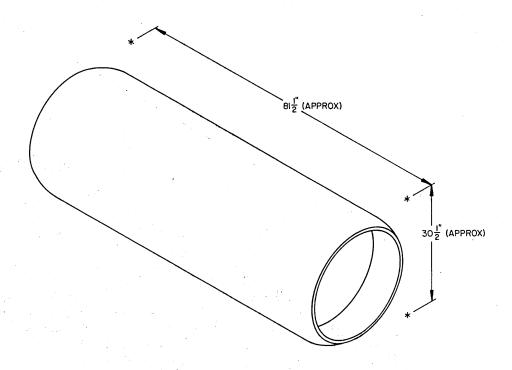
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(GENERAL NOTES CONTINUED)

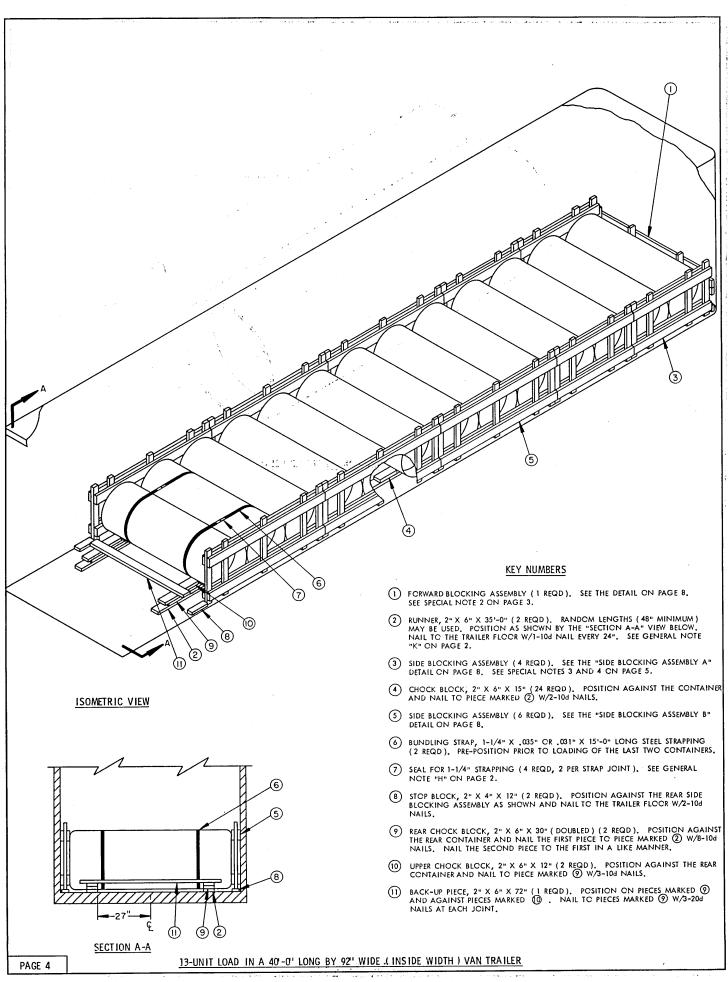
N. PORTIONS OF THE SEMITRAILER BODIES DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDEWALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

O. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

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ONE-TON CONTAINER DETAIL

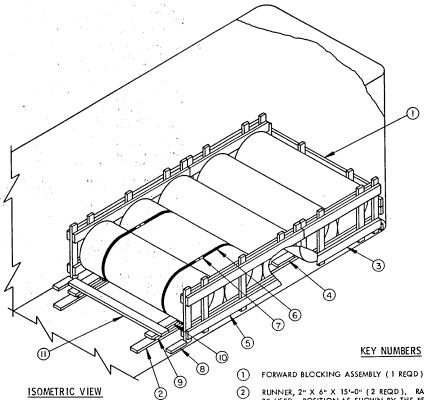


#### SPECIAL NOTES:

- A 13-UNIT LOAD OF ONE-TON CONTAINERS IS SHOWN IN A 40'-0" LONG BY 7'-8" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTE 3.
- A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN. THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, SHOWN AT THE FRONT END OF THE ROUNDED CORNER TRAILER SHOULD ALSO BE USED WHEN THE TRAILER FURNISHED FOR LOADING IS EQUIPPED WITH A SQUARE FRONT.
- 3. THE SIDE BLOCKING ASSEMBLIES, PIECES MARKED (3) AND (3) ARE DESIGNED FOR LATERAL BRACING IN A 91" TO 92" WIDE TRAILER. IF THE TRAILER TO BE USED IS 89-1/2" TO 91" IN WIDTH, THE HORIZONTAL PIECES ON THE ONE-TON CONTAINER SIDE OF THE SIDE BLOCKING ASSEMBLIES SHOULD BE CHANGED TO 1" X 6" MATERIAL AND BE NAILED W/64 NAILS. THE PROPER THICKNESS OF HORIZONTAL PIECES SHOULD BE SELECTED SO AS TO PROVIDE GOOD SIDE BEARING AND YET FACILITATE LOADING OF THE ONE-TON CONTAINERS AND/OR INSERTION OF THE SIDE BLOCKING ASSEMBLIES. THE TOTAL EXCESS SPACE ACROSS A TRAILER SHOULD NOT EXCEED 1-1/2". NOTE THAT ASSEMBLIES ON OPPOSITE SIDES OF THE TRAILER NEED NOT BE ALIKE; 1" MATERIAL MAY BE USED AGAINST A CONTAINER ON ONE SIDE WHILE 2" MATERIAL IS USED AGAINST THE CONTAINER ON THE OPPOSITE SIDE, OR 1" MATERIAL MAY BE LAMINATED TO EITHER 2" LOAD BEARING PIECE IN ORDER TO SATISFY THE 1-1/2" MAXIMUM EXCESS SPACE CRITERION.
- 4. IF THE ONE-TON CONTAINERS ARE LOADED INTO THE TRAILER BY USING A SPECIAL HANDLING DEVICE FOR LIFTING OF THE CONTAINERS, THE SIDE BLOCKING ASSEMBLIES MUST BE INSERTED AFTER POSITIONING OF THE CONTAINERS. IF THE ONE-TON CONTAINERS ARE HANDLED BY CARRYING ON THE TINES OF A FORK LIFT TRUCK, IT IS RECOMMENDED THAT THE SIDE BLOCKING ASSEMBLIES BE POSITIONED PRIOR TO LOADING THE CONTAINERS.
- FOR A LOAD QUANTITY OTHER THAN 13, THE COMBINATION OF 3-LONG AND 2-LONG SIDE BLOCKING ASSEMBLIES SHOULD BE ADJUSTED AS NECESSARY TO SUIT THE QUANTITY BEING SHIPPED.
- 6. THE 13-UNIT LOAD SHOWN MAY BE HEAVY ON THE DRIVE AXLES OF A WESTERN TYPE TRAILER, DEPENDING UPON THE ACTUAL GROSS WEIGHT OF THE CONTAINERS BEING SHIPPED AND UPON THE WEIGHT OF THE TRACTOR BEING USED. IF THE LOAD DOES NOT SCALE PROPERTY FOR THE STATES THRU WHICH A LOAD IS TO BE TRANSPORTED, THE LOAD SHOULD BE SEPARATED NEAR THE MIDDLE OF THE LENGTH. SEE THE "CONTAINER SPACING" DETAIL ON PAGE 9 FOR GUIDANCE.

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	149	100
2" X 6"	425	425
NAILS	NO. REQD	POUNDS
10d (3")	542	8-1/2
20d (4")	6	1/4

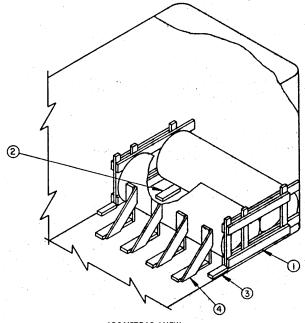
LOAD AS SHOWN



- SPECIAL NOTES:
- A 5-UNIT LOAD OF ONE-TON CONTAINERS IS SHOWN IN A 7'-8" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER, TRAILERS OF OTHER WIDTHS CAN BE USED. SEE SPECIAL NOTE 3 CN PAGE 5.
- A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN.
  THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, SHOWN AT THE
  FRONT END OF THE ROUNDED CORNER TRAILER SHOULD ALSO BE USED
  WHEN THE TRAILER FURNISHED FOR LOADING IS EQUIPPED WITH A SQUARE
- THE 5-UNIT LOAD IS SHOWN AS A TYPICAL LTL LOAD. THE NUMBER OF CONTAINERS CAN BE ADJUSTED TO SUIT. IF A LOAD CONSISTS OF MORE THAN 5 ONE-TON CONTAINERS, 30" LONG REAR CHOCKS AS SHOWN ON PAGE 4 BY PIECE MARKED (9) SHOULD BE USED IN LIEU OF PIECE MARKED ON THIS PAGE.
- IF THE ONE-TON CONTAINERS ARE LOADED INTO THE TRAILER BY USING A SPECIAL HANDLING DEVICE FOR LIFTING OF THE CONTAINERS, THE SIDE BLOCKING ASSEMBLIES MUST BE INSERTED AFTER POSITIONING OF THE CON-TAINERS. IF THE ONE-TON CONTAINERS ARE HANDLED BY CARRYING ON THE TIMES OF A FORK LIFT TRUCK, IT IS RECOMMENDED THAT THE SIDE BLOCKING ASSEMBLIES BE POSITIONED PRIOR TO LOADING THE CONTAINERS.
- FOR A LOAD QUANTITY OTHER THAN 5, THE COMBINATION OF 3-LONG AND 2-LONG SIDE BLOCKING ASSEMBLIES SHOULD BE ADJUSTED AS NECESSARY TO SUIT THE QUANTITY BEING SHIPPED.

- FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 8.
- RUNNER, 2" X 6" X 15'-0" (2 REQD), RANDOM LENGTHS (48" MINIMUM) MAY BE USED, POSITION AS SHOWN BY THE "SECTION A-A" VIEW ON PAGE 4. NAIL TO THE TRAILER FLOOR W/1-10d NAIL EVERY 24", SEE GENERAL NOTE "K" ON 2
- SIDE BLOCKING ASSEMBLY ( 2 REQD ). SEE THE "SIDE BLOCKING ASSEMBLY A" DETAIL ON PAGE 8. SEE SPECIAL NOTES 3 AND 4 ON PAGE 5. (3)
- CHOCK BLOCK, 2" X 6" X 15" (8 REQD). POSITION AGAINST THE CONTAINER AND NAIL TO PIECE MARKED @ W/2-10d NAILS.
- SIDE BLOCKING ASSEMBLY (2 REQD). SEE THE "SIDE BLOCKING ASSEMBLY B" (5) DETAIL ON PAGE 8.
- BUNDLING STRAP, 1-1/4" X .035" OR .031" X 15'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION PRIOR TO LOADING OF THE LAST TWO CONTAINERS.
- SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP JOINT). SEE GENERAL NOTE
- STOP BLOCK, 2" X 4" X 12" (2 REQD). POSITION AGAINST THE REAR SIDE BLOCKING ASSEMBLY AS SHOWN AND NAIL TO THE TRAILER FLOOR W/2-10d
- REAR CHOCK BLOCK, 2" X 6" X 24" (DOUBLED) (2 REQD), POSITION AGAINST THE REAR CONTAINER AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/6-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. (9)
- UPPER CHOCK BLOCK, 2" X 6" X 12" (2 REQD). POSITION AGAINST THE REAR CONTAINER AND NAIL TO PIECE MARKED ① W/3-10d NAILS.
- BACK-UP PIECE, 2" X 6" X 72" ( 1 REQD ). POSITION ON PIECES MARKED  $\odot$  AND AGAINST PIECES MARKED  $\odot$  . NAIL TO PIECES MARKED  $\odot$  W/3-20d NAILS AT EACH JOINT,

TYPICAL LTL, 5-UNIT LOAD



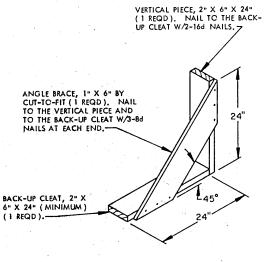
## ISOMETRIC VIEW

#### SPECIAL NOTES:

- A 2-UNIT LOAD OF CNE-TON CONTAINERS IS SHOWN IN A 7'-8" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER WIDTHS CAN BE USED.
- FOUR (4) LTL BRACES ARE ADEQUATE FOR RETAINING ONLY TWO (2) ONE-TON CONTAINERS. A LCAD OF MORE THAN TWO CONTAINERS WILL NOT BE BLOCKED AND BRACED WITH LTL BRACES. REFER TO THE PROCEDURES ON PAGE 6 FOR BLOCKING AND BRACING GUIDANCE.
- 3. IF A 1-UNIT LOAD IS TO BE SHIPPED, THE "SIDE BLOCKING ASSEMBLY D" AS DETAILED ON PAGE 9 WILL BE USED IN LIEU OF PIECES MARKED ①. THE SIDE BLOCKING ASSEMBLY SHOWN AND THE SIDE BLOCKING ASSEMBLY OF ARE DESIGNED FOR USE IN TRAILERS HAVING ROUNDED CORNERS AT THE FORWARD END BUT ARE ALSO APPLICABLE FOR USE IN SQUARE FRONT TRAILERS.
- 4. IF THE ONE-TON CONTAINERS ARE LOADED INTO THE TRAILER BY USING A SPECIAL HANDLING DEVICE FOR LIFTING OF THE CONTAINERS, THE SIDE BLOCKING ASSEMBLIES MUST BE INSERTED AFTER POSITIONING OF THE CONTAINERS. IF THE ONE-TON CONTAINERS ARE HANDLED BY CARRYING ON THE TIMES OF A FORK LIFT TRUCK, IT IS RECOMMENDED THAT THE SIDE BLOCKING ASSEMBLIES BE POSITIONED PRIOR TO LOADING THE CONTAINERS.

#### KEY NUMBERS

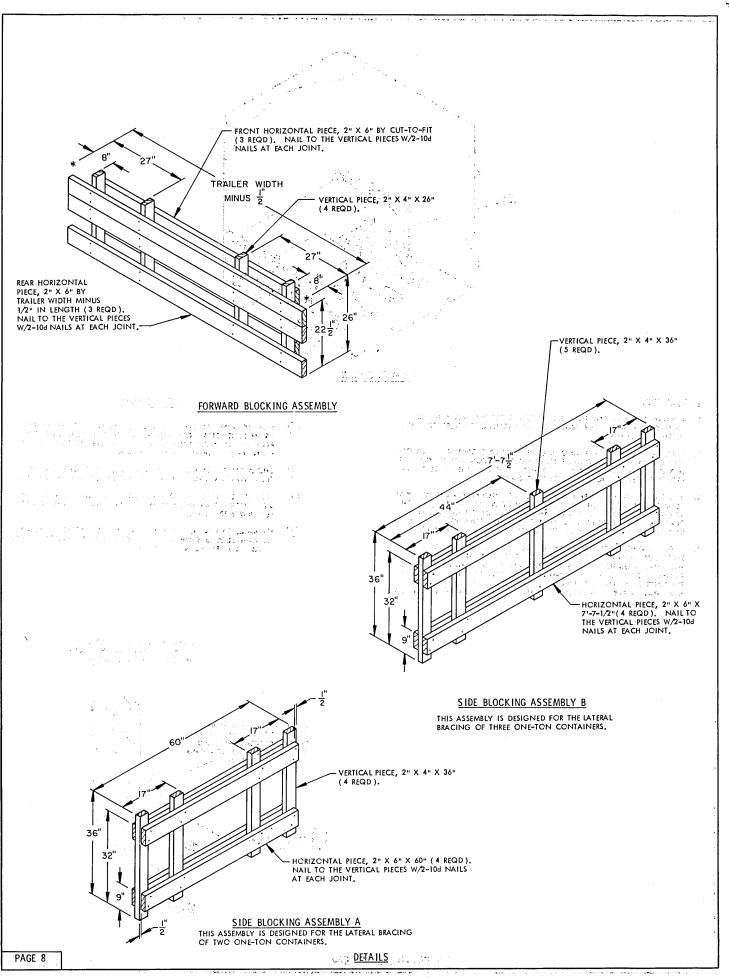
- SIDE BLOCKING ASSEMBLY (2 REQD). SEE THE "SIDE BLOCKING ASSEMBLY C" DETAIL ON PAGE 9. SEE SPECIAL NOTE 3 AT LEFT AND GENERAL NOTE "K" ON PAGE 2. SEE SPECIAL NOTES 3 AND 4 ON PAGE 5 FOR ADDITIONAL GUIDANCE.
- CHOCK BLOCK, 2" X 6" X 15" (2 REQD). POSITION AGAINST THE CONTAINER AND NAIL TO THE TRAILER FLOOR W/2-10d NAILS.
- STOP BLOCK, 2" X 4" X 12" (2 REQD). POSITION AGAINST THE SIDE BLOCKING ASSEMBLY AS SHOWN AND NAIL TO THE TRAILER FLOOR W/2-10d NAILS.
- 4 LTL BRACE (4 REQD). SEE THE DETAIL BELOW. POSITION AGAINST CONTAINER, AS SHOWN, AND NAIL TO THE TRAILER FLOOR W/7-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.

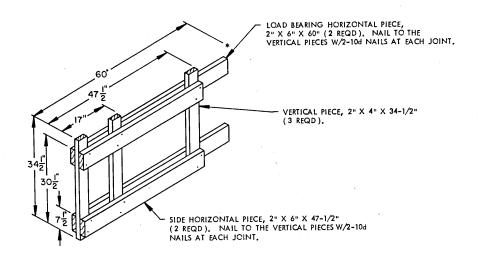


LTL BRACE

TYPICAL LTL, 1-UNIT LOAD

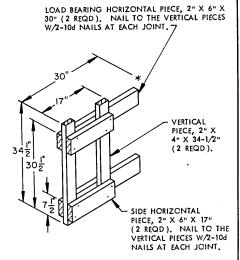
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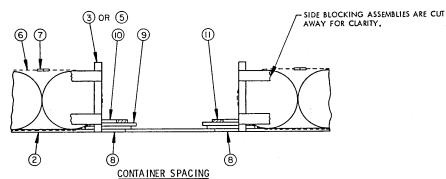
# SIDE BLOCKING C

THIS ASSEMBLY IS DESIGNED FOR THE LATERAL BRACING OF TWO ONE-TON CONTAINERS AT THE FORWARD END OF A ROUNDED CORNER TRAILER.



# SIDE BLOCKING D

THIS ASSEMBLY IS DESIGNED FOR THE LATERAL BRACING OF A SINGLE ONE-TON CONTAINER AT THE FORWARD END OF A ROUNDED CORNER TRAILER.



CUNIAINEK SPACING

THIS VIEW DEPICTS THE METHOD FOR PROVIDING LCAD SEPARATION. SPACING OF CONTAINERS MAY BE NECESSARY IN ORDER TO CBTAIN PROPER WEIGHT DISTRIBUTION. SEE SPECIAL NOTE 6 ON PAGE 5. REFER TO PAGE 6 FOR DESCRIPTION OF KEY NUMBERED PIECES; QUANTITY WILL VARY FROM THAT SPECIFIED ON PAGE 6.

**DETAILS** 

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